

BEHAVIOR AND DEVELOPMENT PATTERNS IN CHILDREN BORN TO HEROIN-ADDICTED AND METHADONE-ADDICTED MOTHERS

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This paper reviews the literature regarding the development of children up to age 6 years who were born to mothers addicted to heroin or methadone. These children are compared with children born to nonaddicted mothers to determine whether there were any differences between the two groups related to maternal drug addiction. This paper discusses the obstetrical and medical complications associated with maternal drug addiction and their effects on the prognosis of the infant at delivery.

The objective of this paper was to review the literature regarding the behavior and development patterns in children (aged 6 years and younger) of heroin- and methadone-addicted mothers and compare them with children born to nonaddicted mothers to find out whether there were any differences between these two groups related to maternal drug addiction. Heroin and methadone are both opiates. Heroin is converted to morphine in the body and has a half-life of 30

minutes. Methadone is a synthesized morphinelike compound, which has a longer half-life of 20 to 30 hours. Heroin and methadone cause central analgesia and euphoria, producing a feeling of dependence or addiction.

OBSTETRICAL COMPLICATIONS

Most drug-abusing women neglect their health and are therefore predisposed to various obstetrical and medical problems that affect the morbidity and mortality of their infants at birth. Obstetrical complications¹ associated with heroin addiction include abortion, abruptio placentae, amnionitis, and chorioamnionitis. Chorioamnionitis may lead to sepsis and meningitis in the neonate with consequent neurologic deficits. Other obstetrical complications include placental insufficiency, intrauterine growth retardation, preeclampsia, and eclampsia. Intrauterine growth retardation may lead to small-for-gestational-age babies who are at increased risk of perinatal asphyxia, hypoglycemia, hypothermia, pulmonary hemorrhage, polycythemia, and necrotizing enterocolitis. Gestational diabetes mellitus may occur, and this may be associated with large-for-gestational-age babies. These babies are at increased risk for birth trauma, hyaline membrane disease, and transient tachypnea of the newborn. They are also at risk for hypoglycemia, hypocalcemia, hypomagnesemia, hypothermia, polycythemia, and congenital abnormal-

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ities. Septic thrombophlebitis was also noted in these mothers. Wilson et al² in their study of 30 heroin-addicted mothers noted breech presentation, precipitous labor and delivery, meconium-stained amniotic fluid, and respiratory depression of the neonate at delivery.

NEONATES

Neonates born to heroin-addicted mothers were on the average small for gestational age with low birthweight and smaller head circumference.² While it was noted that heroin-addicted mothers tended to have less prenatal care than non-heroin-addicted mothers, Ramer et al,³ in 1973, performed intrauterine growth studies that revealed that the heroin-addicted mother's fetus was significantly smaller than the normal fetus at any gestational age even when prenatal care and nutrition were controlled. Naeye et al,⁴ in 1973, showed that the growth retardation in these babies was related to a subnormal number of cells in all organs of the developing fetus. Babies of methadone addicts were noted to have a normal birthweight.⁵ However, they had a greater postnatal weight loss because of hyperactivity and sleep disturbances.

Neonatal drug withdrawal symptoms were noted in neonates of heroin- and methadone-addicted mothers. Neonates born to the latter, however, had a higher incidence of drug withdrawal and more severe symptoms when compared with those born to heroin addicts.⁶ Neonatal drug withdrawal symptoms mainly involved the central nervous and gastrointestinal systems. Central nervous system effects included irritability, increased muscle tone, shrill crying, inability to sleep, and hyperactive deep tendon reflexes. Uncoordinated and ineffective sucking and swallowing reflexes were noted. Gastrointestinal symptoms included nonnutritive sucking, vomiting, diarrhea, and progressive weight loss.

Other signs and symptoms of withdrawal may include yawning, sneezing, sweating, nasal stuffiness, and intermittent cyanosis. Skin pallor, excoriation of the skin due to constant squirming, and poor temperature regulation may be present. The onset of these symptoms may be within minutes of birth up to two weeks of age, and may last for six days to eight weeks. However, symptoms of irritability may persist for

more than three months.⁷ Wilson et al² described a phase of subacute withdrawal upon transfer from the hospital to the home environment that consisted mainly of hyperphagia and hyperacusis and rarely persisted after six months. Hypertonicity generally subsided after six to seven months.

There was a decreased incidence of respiratory distress syndrome in premature infants of the drug-addicted mothers. A study by Glass et al⁸ of 33 premature infants born to heroin-addicted mothers at Harlem Hospital Center showed no respiratory distress syndrome.⁸ This suggests that the opiates may act as enzyme inducers leading to an increase in 2,3-diphosphoglycerol and decreased oxygen affinity.¹

The incidence of sudden infant death syndrome in a study of 688 infants born to opiate-addicted mothers compared with 388 controls was found to be five times greater in opiate-addicted infants than in normal controls.⁹ This increased incidence may be due to a depressed ventilatory response to carbon dioxide in the opiate-addicted children, and further research in this area is needed.

Infants of opiate-addicted mothers experienced abnormal sleep patterns with an increase in rapid-eye-movement sleep and a decrease in quiet sleep. This finding was reported by Dinges et al⁶ in their study on fetal exposure to narcotics in which they studied neonatal sleep as a measure of nervous system disturbance in 28 newborns of mothers in a methadone-treatment program.

Opiate-addicted infants were also noted to have a poor response to visual stimuli, decreased orientation to auditory stimuli, and deficient interactive behavior.¹⁰

TODDLERS

Toddlers of opiate-addicted mothers were found to be highly energetic, talkative, and easily distracted, with brief attention spans. Their goal-directedness was brief.⁷ Some studies suggested that the toddlers had immature object manipulation, especially with regard to fine motor skills. Cognitive, speech, and perceptual disturbances were noted. Sleep disturbances also occurred. These features can be very frustrating to the drug-addicted mother who has high expectations for her child, and thus the child may be at high risk for child abuse.

PRESCHOOL

Bauman and Levine¹¹ studied 70 children aged 3 to 6 years and their methadone-maintained mothers (from January 1981 to March 1983) and compared them with 70 children aged 3 to 6 years born of non-addicted mothers. They compared the mothers' personalities, intelligence, and parenting attitudes and their effects on the children's intelligence, behavior, and development to find out whether there was an intergenerational cycle of addiction. The mothers were matched for race, socioeconomic status, and whether a male figure participated in the child's upbringing for 70 percent of the child's life. Their results were as follows: (1) Children of methadone-maintained mothers had a higher incidence of adverse behavior such as yelling, whining, teasing, and physical abuse of other children as compared with children of nonaddicted mothers. The fact that the methadone-maintained mothers tended to humiliate, command, disapprove of and yell at these children may have contributed to their children's impairment. (2) The children of methadone-maintained mothers had lower intelligence quotient scores than children of non-drug-addicted mothers on the Stanford-Binet Intelligence Scale. In this study, the researchers found that the methadone-maintained mothers themselves also had low average intelligence quotient scores, and they suggested that the children were not receiving adequate intellectual stimulation at home. (3) Children of the methadone-maintained mothers had a lower level of learning and adapting to new situations than those of non-drug-addicted mothers. (4) There was a lower height, weight, and general level of development in children of methadone-maintained mothers as compared with children of non-drug-addicted mothers. (5) There were no significant gross motor differences in children of methadone-maintained mothers as compared with children of non-addicted mothers.

Bauman and Levine concluded that there may be an intergenerational cycle of addiction.

CONCLUSIONS

Maternal drug addiction with its consequent deleterious effects on neonates and children is becoming a major health program in the United States. The age group birth to 6 years was chosen because these are

the child's formative years and various physical and social insults to these children may affect their future adult lives. This population of children born to heroin- and methadone-addicted mothers are born with handicaps related to growth retardation and behavior and developmental delays. Their outlook is further compromised because of their early childhood deprivation, as their mothers themselves are victims of drug addiction, faulty parenting, and social deprivation. The intergenerational cycle of drug addiction makes it imperative not only to identify the problem but also to take definite steps to break this cycle and help these children who are the future citizens of this country.

RECOMMENDATIONS

1. Drug-addicted mothers should be educated on the possible deleterious effects of their drug abuse on the fetus and child and should be encouraged to seek prenatal care as soon as pregnancy is suspected.
2. Pregnant drug abusers should be designated as high-risk patients and should be provided with comprehensive pharmacotherapy and obstetrical care. Pharmacotherapy may involve voluntary drug-free therapeutic communities or drug detoxification.
3. Psychosocial counseling by experienced counselors aware of the medical and social needs of this population should be done.
4. Mother and infant attachment should be encouraged and the parenting skills of drug-addicted mothers should be enhanced. This will help the mothers cope with the frustrating withdrawal symptoms of their children and help prevent child abuse in these children.
5. Careful assessment and management of the behavior and development patterns of the children of drug-addicted mothers should be done both in the hospital and on follow-up visits.
6. Early intervention programs and preschool enrollment in such programs as Head Start should be instituted in order to help identify learning disabilities early and deal with them effectively. Such programs will also provide the children with an intellectually stimulating environment.
7. Further research on the effects of heroin and methadone on the sudden infant death syndrome should be done.

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